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Abstract The present invention provides the technique related to a kind of semiconductor memory device that is composed of the following devices: a semiconductor substrate 11; the gate insulation film 12 formed on the semiconductor substrate 11; a single gate electrode 13 formed on the gate insulation film 12; two charge maintaining portions 61, 62 located on both sides of the gate electrode 13 sidewall; the source/drain regions 17, 18, which correspond to the charge maintaining portions 61 and 62, respectively; and the channel region, which is disposed under the single one gate electrode 13. Thus, the memory function of two charge maintaining portions 61, 62, and the transistor action function of gate insulation film 12 are separated so as to obtain adequate memory function and the capability of thinning gate insulation film 12 such that short channel effect can be easily controlled. In addition, because two charge maintaining portions 61, 62 formed on both sides of the gate electrode 13 are separated by the gate electrode 13, it is capable of effectively suppressing the interference phenomenon when rewriting. Furthermore, by appropriately setting the voltage of gate electrode 13, the voltage of one side of diffusion layer region 17, and the voltage of the other side of diffusion layer region 18, it is capable of selectively injecting holes or electrons into the charge maintaining portion 62 on one side of the diffusion layer region 18. Therefore, it is capable of providing a semiconductor memory device that can execute binary operation and can be easily miniaturized.

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